

CLAIMS

1. An analysis chip comprising:
a substrate on which a channel is formed,
a sensing element placed in a part of said channel
5 and generating a change in appearance when a particular substance flows through said channel; and
a lens covering said sensing element.
2. The analysis chip according to claim 1, further
10 comprising:
a coating member which is molded integrally with said lens and covering said channel.
3. The analysis chip according to claim 1 to 2, further
15 comprising:
a first illumination member which emits light to said sensing element.
4. An analysis chip comprising:
20 a substrate on which a channel is formed,
a sensing element placed in a part of said channel and generates a change in appearance when a particular substance flows through said channel; and
a first illumination member which emits light to
25 said sensing element.
5. The analysis chip according to any of claims 3 to

4, wherein said light is ultraviolet light.

6. The analysis chip according to any of claims 3 to 5, wherein said substrate is made of a material through which a visible light is transmitted, and said first illumination member emits light from a side face of said substrate.

7. The analysis chip according to any of claims 3 to 5, wherein said first illumination member emits light from an undersurface of said channel.

8. The analysis chip according to any of claims 3 to 7, wherein said first illumination member is an optical waveguide.

9. The analysis chip according to any of claims 1 to 9, wherein said sensing element includes a reagent in which an appearance is changed by a reaction with said particular substance.

10. The analysis chip according to claim 9, wherein said reagent is uniformly distributed in said sensing element.

11. The analysis chip according to claim 10, further comprising:

a scale which is placed along said sensing element.

12. An analysis chip comprising:
a substrate on which a channel is formed,
a sensing element placed in a part of said channel
5 and in which a reagent which generates a change in
appearance in a chemical reaction with a particular
substance is uniformly distributed; and
a scale which is placed along said sensing element.
- 10 13. The analysis chip according to any of claims 9 to
12, wherein said reagent includes at least one member
selected from the group consisting of an enzyme, an
antibody, an antigen and a fluorescent material.
- 15 14. The analysis chip according to any of claims 1 to
13, further comprising:
a reactor which is formed on said channel and in
which an indication substance to be specifically coupled
to a particular component is placed; and
20 a catcher which is formed on a downstream side from
said reactor of said channel and catches said indication
substance coupled to said particular component.
15. An analysis chip comprising;
25 a substrate on which a channel is formed,
a reactor which is formed on said channel and in
which an indication substance to be specifically coupled

to a particular component is placed; and

a catcher which is formed on a downstream side from said reactor of said channel and catches said indication substance coupled to said particular component.

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16. The analysis chip according to any of claims 14 to 15, wherein a width of said channel of a region where said catcher of said channel is formed is gradually narrowed toward an advancement direction of said channel.

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17. The analysis chip according to any of claims 14 to 16, wherein a density of said indication substance in said catcher is higher toward a downstream side of said channel.

15 18. The analysis chip according to any of claims 1 to 17, wherein said channel gradually narrows toward a downstream side, and

a hydro-gel layer whose volume is changed when said particular substance is absorbed is placed on a wall
20 surface of said channel, and

said change in appearance is occurred by a closing of said channel at a different position depending on an amount of said particular component because a volume of said hydro-gel layer is changed when colored said
25 particular component flows in said channel.

19. The analysis chip according to any of claims 1 to

17, further comprising:

a bead placed in said channel and whose surface is formed by a hydro-gel layer whose volume is changed when absorbing said particular component,

5 wherein said channel gradually narrows toward a downstream side is placed, and

said change in appearance is occurred when a liquid flows in said channel and said bead is carried away by said liquid and stopped at a different position in said channel
10 depending on a volume.

20. An analysis chip comprising;

a substrate on which a channel gradually narrowed toward a downstream side is formed; and

15 a hydro-gel layer which is placed along a wall surface of said channel and closes said channel at a different position depending on an amount of a particular component by swelling when said particular component is absorbed.

20

21. An analysis chip comprising;

a substrate on which a channel gradually narrowed toward a downstream side is formed; and

a hydro-gel layer in which said channel is closed
25 at a predetermined initial close position, and a contraction resulting from an absorption of a particular component causes a position, where said channel is closed,

to move to a downstream side from said initial close position.

22. An analysis chip comprising;

5 a substrate on which a channel gradually narrowed toward a downstream side is formed; and

a bead placed in said channel and whose surface is formed by a hydro-gel layer whose volume is changed when absorbing a particular component,

10 wherein said bead is carried away by said liquid and stopped at a different position in said channel depending on a volume.

23. The analysis chip according to any of claims 1 to 15 22, further comprising;

a polymer solution placed inside said channel in which a reaction with said particular substance changes a viscosity of said polymer,

a target bead placed inside said channel; and

20 a tentative holder that is placed at a predetermined position inside said channel and holds said target bead at said predetermined position when a force weaker than a predetermined magnitude is applied to said target bead.

25 24. An analysis chip comprising;

a substrate on which a channel is formed,

a polymer solution placed inside said channel in

which a reaction with a particular substance changes a viscosity of said polymer,

a target bead placed inside said channel; and

a tentative holder that is placed at a predetermined
5 position inside said channel and holds said target bead at said predetermined position when a force weaker than a predetermined magnitude is applied to said target bead.

25. The analysis chip according to any of claims 23 to
10 24, wherein said target bead includes a ferromagnetic material.

26. The analysis chip according to any of claims 23 to 25, further comprising;

15 a pair of electrodes formed at ends of said channel, and

a battery which generates a potential difference between said pair of electrodes,

wherein a surface of said target bead is charged in
20 a solution of a predetermined pH.

27. The analysis chip according to any of claims 1 to 26, wherein said channel includes;

a solution holder which contains a solution through
25 capillary attraction; and

an introduction path which introduces a solution into said solution holder through capillary attraction.

28. The analysis chip according to claim 27,
wherein said analysis chip comprises a plurality of
said channels, and

5 a plurality of said solution holders each of which
is included in each of said plurality of channels hold a
different amount of solution each other.

29. An analysis chip comprising;

10 a substrate on which a channel is formed,
a solution holder which is placed in said channel
and contains a solution through capillary attraction,
an introduction path which introduces a solution
into said solution holder through capillary attraction;
15 and

a sensing element placed in a part of said channel
and generating a change in appearance when a particular
substance flows through said channel.

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30. An analysis chip comprising;

a substrate on which a first channel and a second
channel are formed,

a first solution holder formed in said first
25 channel; and

a second solution holder formed in said second
channel,

wherein said first solution holder holds a solution of a first predetermined amount through a capillary attraction, and

5 said second solution holder holds a solution of a second predetermined amount different from said first predetermined amount through a capillary attraction.

31. The analysis chip according to claim 30,
wherein numerals corresponding to said first
10 predetermined amount and said second predetermined amount are displayed on said substrate.

32. The analysis chip according to any of claims 1 to 31,
15 wherein said channel is a rectangular groove formed on a surface side of said substrate, and
further comprising a reflector that is placed along a bottom surface of said substrate and reflects a visible light.

20 33. The analysis chip according to any of claims 1 to 32,
wherein a wall surface of said channel is covered with a material whose refractive index is equal to or less
25 than a refractive index of water.

34. The analysis chip according to any of claims 1 to

33, further comprising;
a transparent cover covering said channel,
wherein a distance between a bottom surface of said
channel and said cover is continuously changed in an
5 lengthwise direction of said channel, and
an interference band whose position is different
depending on a refractive index of a substance filled in
said channel is displayed on an outer side of said cover
by reflection of light between said bottom surface and said
10 cover.

35. An analysis chip comprising:
a substrate on which a channel is formed; and
a transparent cover covering said channel,
15 wherein a distance between a bottom surface of said
channel and said cover is continuously changed in an
lengthwise direction of said channel, and
an interference band whose position is different
depending on a refractive index of a substance filled in
20 said channel is displayed on an outer side of said cover
by reflection of light between said bottom surface and said
cover.

36. An analyzing apparatus comprising:
25 an analysis chip according to any of claims 1 to 35;
and
a second illumination member emitting light to said

sensing element from a side face of said analysis chip.

37. The analyzing apparatus according to claim 36,
wherein said light which said second illumination member
5 emits to said sensing element is ultraviolet light.

38. The analyzing apparatus according to any of claims
36 to 37, wherein said second illumination member includes
a light collecting lens collecting light to said sensing
10 element.

39. The analyzing apparatus according to any of claims
36 to 37, wherein said second illumination member is a light
emitting member.
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40. The analyzing apparatus according to claim 36,
wherein said illumination member is any of a bulb, LED and
black light.